

The Use Vergil Makes of Book
1 of Varro's De re Rustica

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Subject and general nature of the two works.

Varro's treatise on Agriculture is a practical work written when the author was eighty years old and addressed to his wife Fundania. "Since you have bought a farm," he writes, "which you wish to make fruitful by cultivating it well, and you ask that I take care of it, I will try. And not only will I try to advise you while I live as to what should be done, but even after my death." Varro says he came into the temple of Tellus at the seed time festival being invited by the overseer. There he met a number of friends who had also been invited. As the overseer had not yet come, they sat down to wait for him. Their conversation about Agriculture forms the first book of the "De Re Rustica".

The work as a whole consists of three books; the first about the cultivation of the fields, the second about cattle and the third, treats of the provisions or moderate luxuries which a plain farmer may procure, as poultry, fish and game.

This treatise was published just before Vergil began to write his poem. He seems to have made very little use of the first book of Varro, but from the second he borrows a great number of the precepts which he gives in his Third and Fourth Georgics.

Our editor says nearly all that is didactic in these books.

The Georgics consists of four books. The first, treating of the cultivation of the fields; the second, the training of vines; the third, the care

of cattle and the fourth, the keeping of bees. Thus we see the poet does not touch upon the things treated in Varro's third book neither is much use made of the first book. But from the second, as has been said, he obtained nearly all the didactic points given in his third Georgic.

The spirit and style of the two works however are entirely different. Varro desired nothing more in his work on farming than that it should give full and accurate information in regard to questions which might come up in connection with the farm, that it might be a work, as he himself says, to which his wife and others might refer whenever they might be in doubt as to how or when anything should be done. It is therefore written in a very systematic and concise form without digressions or flourishes.

It is plain that Virgil too was really interested in the practical details of agriculture and his knowledge was gained not only from books but also from personal experience of country life.

That the Georgics was truly valuable as a guide for farmers is shown by the fact that the poem was afterwards referred to by both Pliny and Columella as a standard work. His purpose, however, went much further than this. The poem besides being of value for the information it gives, is also a great work of art. Virgil himself speaks of himself as singing the songs of Hesiod through the Roman towns and there are many Greek allusions in the

poem which would please the Romans. Fragmentary digressions, episodes and similes are used to beautify what might otherwise be a rather dry subject. Among these are, the beautiful story of Ophion and Eurydice at the close of the fourth book, the account of the plague at the end of the third book, his eulogy on country life in the second book and numerous little touches throughout the poem, which show his love for country life and nature. Then too the patriotic spirit furnishes much inspiration to this poem as is shown by the extravagant flattery of Augustus with which the Georgics opens, where he speaks among other things of the Scorpion drawing back his claws to make room for the emperor among the constellations. Also by his praise of Italy and its great men, the Decii, Manii, the great Camilli and Scipios and by his tribute to Caesar at the opening of the third Georgic, his patriotic spirit is revealed.

Invocation. Georg. I. 5-42 Varr 1.

Virgil's invocation contains four of the deities invoked by Varro: the Sun, Moon, Bacchus and Ceres. Varro very distinctly invokes them as separate deities. "In the second place I invoke the Sun and Moon whose seasons are observed whenever any thing is planted. In the third place, Ceres and Bacchus because their fruits are especially necessary for food." Virgil says: "You brightest lights of the world that guide the year's smooth course through heaven: Father Liber and kindly Ceres

if it was by your bounty that the earth changed
The acorn of Chaonia for the plump, well-favoured
corn ear and found the grape wherewith to temper
her draught of helious." Some contend that "Liber
et alma Ceres" is in apposition to *cl. clarissima mundi
lumina* and that Virgil intended, to call upon
Bacchus as the sun and the moon as Ceres. Al-
though there are good arguments on both sides, I
believe those against the apposition theory are the
stronger and that Virgil probably followed Varro in
invoking these deities.

The argument is natural in giving
such a long list of deities and is paralleled in A. 16.

The balance of the passage is destroyed if they are
identified, for in giving each deity the poet gives the
reason for which they are invoked. The sun and moon
because they bring the seasons, Bacchus and Ceres,
because they give corn and wine. Lastly, though
Bacchus is sometimes identified with the sun, Ceres
now is with the moon. So I think it is more
natural not to make them in apposition and as
has been said think that Virgil probably followed
Varro in invoking these deities, although he does
not make use of any of the other gods which Varro
invokes.

Virgil's use of Varro in his treatment of
plowing. Georg. I. 43-99 + 208-211 Varro Chap. 27, 29, 39.
Virgil's statements in regard to plow-
ing omitting the disputed lines 47-49, are clear
enough. 43-46. In early spring begin to plow.

42-43 ----- 50-63 - Before you plow an unknown field learn all about its characteristics and what it will produce. 63-70 Come then if the land is rich plow in the spring and summer. But if it is not rich, it will be sufficient to turn up the soil lightly in September. 71-83 Fallowing and Rotating are both good for the fields. 84-99 Burning stubble is good, so is cross plowing. 208-211 When the Balance makes the hours equal for day and sleep, come farmers work the oxen and barley in the fields to the verge of winter. "Usque sub extremum brumar intractabilis inarbum". So we see that Vergil names three plowings. The first in early spring, a cross plowing in summer and a plowing in of the seed (sowed *tauros*) which was sown from the autumnal equinox Sept 21 to "bruma" Dec. 21.

Now Varro's views in regard to plowing. Chap XXIV, he says in telling what should be done in the different seasons; In the spring our ought to plow the earth - neither should you plow less than twice, three times is better.

Chap XXIV 2g. Terram cum primis arant, prociunde appellat, cum iterum, offringere dicunt quod prima aratione glaber grandis solent excitari Tertio cum arant facto seminibus boves lirae dicuntur. id est cum tabellis additis ad vomerem simul et satum frumentum operiunt in porcis et sulcant ~~porcis~~ quo pluvia aqua dilabatur.

Secundo intervallo inter venum arant octavo et virgilianum exortum ----- boves terram

proscindere. Quinto intervallo inter solstitium et
caniculam, arationes absolvi, quae eo fructuosiores
sunt, quo calidior terra aratur. Si proscindere
offringi oportet, id iterum ut frangantur glabris.
Quinto intervallo inter caniculam et autumnum
autumnale oportet - - - - - arata offringi.

Sexto intervallo ab autumnali incipere,
scribunt oportere sere usque ad diem nona-
gimum unum, post brumam nisi quae
necessaria causa corripit non sere.

So Varro, as I interpret. These passages
clearly give three plowings including the seed plowing
as the maximum. The first, between March 21st
and the end of spring. The second, between June
21st and August, if possible, for the earth is more
fruitful the warmer it is when plowed. So if
you have already plowed for the first time cross plow
now. But if you do not cross plow in the summer
it should be done in the fifth interval between
the 21st Aug. and the 21st Sept. Now from the autumn-
al autumn to winter, Sept 21 to Dec 21, and
plow in the seed by the operation called "lirari".

The thought of the two authors so far
is precisely the same. Their language and forms
of expression do not correspond except that Varro
does use "proscindo" line 97, for the first plowing and
"bruma" 211 l for the time when the sowing should be
completed - nor could it be reasonably expected
that ~~it~~ ^{they} would, the one being a prose writer, the other
a poet, and their purposes and motives being so

very different.

Omitting lines 47-48 we have seen that their views are the same. Now is it not reasonable to suppose that these lines agree with the rest of Vergil's treatment, and that if possible they too refer to two plowings?

Four different interpretations have been given for these lines, all of which outside of the context in which they occur are possible meanings.

I. Two plowings. Servius is the only commentator who gives this interpretation. He says: Twice felt the heat and twice the cold means that it has twice felt the heat of the day, and the cold of night.

Through which he shows a double plowing in the spring and autumn.

II. Then there are two four plowing theories. (2) Spring, summer, autumn and the autumn of the previous year. (3) Spring, summer and two autumn plowings.

III. (4) The land should lie fallow two years and thus feel the heat of two plowings in spring, and the cold of two autumn plowings. This theory will not stand at all. According to it the land is only plowed twice a year and besides it drags in the two years of fallowing in which there is positively no sense.

Although the first of the four plowing theories is the commonly accepted view, it is the most unsatisfactory and has the least support of any of the three remaining views. In the first place the context itself will not possibly admit this interpretation.

Not a word is said about an autumn plowing in the previous year. On the other hand Vergil says very emphatically to begin the plowing in the spring.

As far as the authorities on agriculture are concerned Theophrastus is the only one among both Greek and Roman who says anything about an autumn plowing in the previous year. Theoph. de Causis Plant. III XX 7+8. The cultivation of the fallow lands should be in both seasons, the warm and cold in order that the land may feel the cold and heat.

Ἐπειὰ δὲ καὶ ἡδυνῶν. When after the first plowings they fallow the land, again in the spring they turn it up, then in the summer and when they are about to sow they plow it again. It is true Vergil does seem to take his expression "bis quae solent, bis figura sinit" from Theophrastus' Ἐπειὰ δὲ καὶ ἡδυνῶν, and he might easily have borrowed this form of expression from the Greek writer with whom he was familiar, as a pretty poetical way of expressing his own thought though it is entirely different from that conveyed by the Greek. Surely it is altogether unreasonable to contend that Vergil like Theophrastus intended to give a plowing to the previous autumn when the interpretation is entirely out of harmony with the context and with both Roman and Greek practice.

Now we have to decide between the two plowing theory and the other of the four plowing theory—spring, summer, and two autumn plowings. It has already been shown that two plowings fits into the context perfectly. The only ground

for adopting four plowings would be that the Roman and Greek custom - for we know that Vergil was very familiar with the Greek writers - was to plow more than twice and that it was so well established that Vergil could not refer to only two plowings.

The Roman writers before Vergil have been discussed, also one of the Greek writers, Theophrastus, who is the only one of all the Greeks who gives four plowings. Aratus, Theocritus and Homer all mention only three. Hesiod, the most important, it seems to me of the Greek writers, for we know that from him Vergil took the model for his *Georgics* and from him borrowed much of the ground work for his poems, recommends two plowings - in the spring and summer. In the spring turn up the soil and the ground tilled afresh in the summer will not mock your hopes. Hesiod *Epf.* 452.

As we see four plowings was not the custom among the Greeks and even if it had been, Vergil would not probably have set aside Roman authority and followed the Greek in such a practical point.

Now taking up the writers who come after Vergil, the first Columella, gives three plowings - and the seed plowing for rich fields. Col. II 4+8. The first about the Ides of April, second about the 21st of June and again about the Kalends of September. In Oct the sowing is to be done.

Pliny, who came next in time after Vergil gives two plowings as the rule. "After the furrows have been gone over again transversely

The clods are broken with the harrow or rake, and this operation is repeated after the seed is put in but instead of using the harrow, the seed may be covered by the operation called "livare". This is the general statement and then he adds - "it is well to plow five times as is done in parts of Italy and even nine times as they do in Etruria."

Then there is another Roman writer Palladius, but he does not count as a separate authority as he wrote about four centuries after Vergil and followed Columella very closely.

Between these three Roman writers whom we have discussed, two of whom - Columella and Pliny come after Vergil and our Varro, before there is so little difference in point of time that it does not seem possible that Roman custom could have changed. So we have two writers, Varro and Pliny, against one, Columella giving two plowings as the rule and that I take it was the custom in Vergil's time. Thus we see that the context almost demands two plowings and that Roman custom favors it. So I think that these three lines

"Illa segete domum votis respondet avari,

Agricolae, bis quae solent, bis figura sensit,

Illius immensas repraesent horrea masses."

agree with the rest of the passage and that Vergil means to say that the land is to be plowed in the spring and summer and so twice feel the heat of the day and twice the cold of the night. Thus he follows Varro precisely in the matter of plowing.

recommending the first plowing in the spring, the second in summer, and a plowing in of the seed which was to be sown between Sept. 21 and Dec 21.

Fallowing and Rotation, Terry I 70-83 Varo 23, 44

Virgil recommends resting the land by letting it lie fallow every other year or else by rotation, planting grain in a different season where you have taken the 'luxuriant' bean or vetch or lupine with brittle stems.

Varo also expresses the same thought when he says: "As it is important whether you should sow on land that is planted yearly, called *restibilis* or in fallow land which sometimes rests (*vacatur*). In Cynthis they say they plant yearly but so that every third year they produce more abundant crops. (Sicinius) does ought to let the fields rest every other year or else sow with lighter crops which exhaust the land less."

It was a common custom among the Romans and one that is given by almost all the writers on agriculture, to plow in such things as beans, vetches, and lupines to enrich the soil. And this is evidently what Virgil means. Varo expresses the same thought: "Some things must be sown not for immediate use but looking forward to the future - cutting them and leaving them so as to make the ground better."

Thus the lupine is sometimes plowed in before its seeds begin to ripen, and sometimes beans before the pods are ready to be gathered for food - are accustomed to be plowed in for manure.

I think it very likely that Vergil took these precepts in regard to Fallowing and Rotation from Varro.

Irrigation Georg. I 100-117. Varro I 86, 87, 31.

Vergil says he will have a good crop who in the dry seasons irrigates his land. He too, who draws off the moisture from the land when it is too moist.

In speaking of some of the things that are necessary as a preparation for sowing the seed Varro says if a place is not moist it must be irrigated at the proper season. Then in telling the things that should be done in the different intervals. In the first interval the water should be drawn from the fields if they are too wet. Also in the third interval if after the hay is cut the meadows are not moist, irrigate them.

The first precept to water the land, Vergil expresses thus: "What shall I say of him who follows up the fields after the seed has been sown and breaks up the ridges of thin sand, then leads down on the crops the river and the obedient streams and when the parched fields burn with dying grass, behold he entices the water from the blow of the channelled slopes. Prr! it rouses hoarse murmurs along the smooth stones allaying the sun struck ground as it bubbles on."

This is evidently imitated from a passage in the Iliad ~~XX~~ 257 sq.

"As when the peasant to his gardens,
Soft rills of water from the bubbling springs
And calls the floods from high to bless his bowers,

And feed with pregnant streams the plains and
 flowers,
 Rome as he clears whatever their passage stayed
 And marks their future current with the spade,
 Swift o'er the rolling pebbles, down the rills,
 Before him scattering they prevent his pains,
 And shine in many windings o'er the plains.

The resemblance in the thought and manner of expression are too apparent in these lines to mistake Vergil's source. While in the absence of any likeness in connection of thought or in expression between Varro and Vergil it is very probable that the poet gave both the advice in regard to irrigation and drawing off the water, independent of the "De Re Rustica".

Tools for Farming Georg I 160-175 Vano 1734

Vano divides the tools which a farmer needs into three classes: first, vocal, as servants; second, semivocal as oxen and third, mute as wagons, and then discusses each division separately. Vergil's treatment only covers the third division of Vano's. He only names what Vano calls the mute instruments. Here again, neither writer gives a full treatment of the subject. Both caution the farmer, Vergil at the end of his discussion and Vano at the beginning, to prepare his instruments beforehand. Vano only names those things that can be made by the farmer. First those things which are made "ex viminibus et materia rustica" as different kinds of baskets, the threshing sledge (tribula)

stakes and hoes (*rastillus*). Then those things that are made from hemp, flax, rush and palms, as ropes, cords and mats. He then dismisses the subject by saying: "There are many other different kinds of instruments which must be bought, the number varying with the size of the field and gives the number of instruments needed for two hundred and forty acres of olive land and one hundred acres of vine land."

Vergil seems to include in 165 l. *virga praeterea Cerei vilisque supplex*, besides the arbutus harnes and mystic fan of Bacchus, which he mentions, the things said by Varro to have been made "*ex viminibus et rustica materia*", different kinds of baskets "*corbes et fiscinos*".

In the 266 l. also in speaking of what may be done in rainy weather he says, the "*fiscina*" may be worn from the plant twig. But he does not include as Varro does, the thrashing sledges and hoes (*tribula et rastrea*) for they have been given before. Vergil also names *vaques*, drags and plows and gives a description of the plow.

The description of the plow comes from Hesiod 457. It may be possible that Vergil had Varro in mind in the rest of the passage but the similarity is so slight that I should say no use had been made of Varro in this instance.

Thrashing floor. Verg 175-186. Varro 51.

Among his other numerous precepts, Vergil gives directions in regard to the thrashing floor. It should be smoothed with a large roller

kneaded with the hand - and made solid with tenacious chalk that weeds may not creep into it, and that it may not overcome by the dust break into holes and then all kinds of plagues make sport of it. Often the small mouse sets up its house, and builds granaries under the ground or the blind mole, digs its hiding place or loads are found in the hollows and many other monsters which the earth produces and the wrivil and ant fraying old age ravage a large heap of corn.

Varron - The threshing floor should be in a high place where the wind may blow through it. The size should be in accordance with the size of the crop. It should be round and raised a little in the middle so that if it rains the water may not stand in it and may flow out by the shortest way. It should be paved with solid earth and if possible with white clay (argilla) that it may not become full of cracks from the heat, hide the grain and receive water thus opening up mouths for mice and ants. Some are accustomed to sprinkle it with oil for it is poisonous to ants and moles.

Vergil says nothing about the situation, size and shape of the threshing floor but both emphasize the fact that it is to be made solid Vergil says with chalk (creta), Varron with white clay (argilla) and both give the same reasons but the threshing floor cracked with heat - here again they do not use the same word, Vergil "pulvis", Varron "arsti" - should be

injured by ants, moles or mice. Virgil also mentions birds, thorns, worms and toads.

Cato too gives directions for the treading floor. Cato 91 + 12? Dig the earth a little, sprinkle it well with oil that it may be well soaked.

Beat it to powder and smooth it with a rolling stone or a rammer. When it is smooth, the weeds will not be troublesome and when it rains it will not grow muddy. Chap. 91 says the same thing in substance except that Cato adds here, "neither will grass harm it after it is rolled smooth."

After examining all three passages it seems to me probable that Virgil made use of both Varro and Cato. The poet's directions that the floor is to be made solid with chalk that it may not break into holes, is very suggestive of Varro. While the fact that he says to make it smooth with a large roller and the mention of weeds creeping in seems to come from Cato.

Times for sowing. Verg 204-230 Varro 29, 32, 34

Virgil in his brief treatment of the times for sowing does not seem to have followed Varro except in his general statement as to the time for fall sowing. For this both authors give exactly the same time. Virgil expresses it in these words. "When the Balance has made the hours equal between day time and sleep and divides half the circle of the sky to light and half to shade, exercise the oxen, sow barley in the fields until the beginning of the winter rains. Where barley is probably used, as Chaucer says, to represent all grains. Varro says - Chap 34 In the

sixth interval we should begin to sow from the autumnal equinox to the ninety first day. After the winter solstice - post burman - we ought not to sow.

Thus both authors recommend sowing from Sept. 21st to Dec 21st. I think it likely that Virgil borrowed this general statement as to the time for fall sowing from Varro but in what follows when he gives the time for sowing various things he does not seem to have used Varro. Neither of the two writers give a full treatment of the times for sowing, but each mention a few things which should be sown at stated times. Each gives some things which the other does not mention and where they both give the same things they do not always agree exactly as to the time for sowing them. Virgil says beans (faba) should be sown in the spring except the cheap kidney bean (vilem phasolum) which is sown at the setting of Bootes. Varro says beans (faba) using the same word should be sown at the setting of Pluades in November. Vitches and lentil according to Virgil are sown from the setting of Bootes Nov. 1st to the middle of the frosty season. Varro says from June 21 to the beginning of August.

Lucky and Unlucky days of the lunar months

Georg I 276-286. Varro chap. 37.

Virgil's and Varro's treatment of the lucky and unlucky days, are entirely different.

Virgil's discussion is brief - only three days being mentioned at all for good or evil. The fifth is bad, the seventh is good, the ninth is good for runaway but not for thieves.

Vano says the lunar days too must be observed. They are divided into two parts because the moon increases from the new moon to the full and then decreases to the new moon. Certain things should be done in the fields when it is increasing rather than when it is growing old.

And on the other hand some things should be done when it is decreasing rather than increasing. For example if sheep and goats are sheared when the moon is increasing care should be taken that they are not entirely bare.

Adaptability and nature of soils.

Long I 53-63 #109-135 + 177-225. Vano 7 + 9.

Vergil first treats of the adaptability of soils in connection with his discussion of plowing. He says "Before you plow, you should learn the traditional culture and nature of the places what each region produces, and what it refuses. Here grain, there grapes grow more abundantly, elsewhere trees and grass grow unbidden. No Timolus sends forth its saffron fragrance, the naked Chalybes iron, Portus castor, Epirus horses. his treatment of

In connection with the nature of the soil Vano says: It is important what things can be sown and grow in a field, for all things cannot grow well in the same field. For one place is suited for wine, another for grain so in regard to other places one is best suited for one thing another for another. After these general statements both writers give examples of countries and the things they produce. The places they men-

mention are in no case the same, and the purpose of the two authors in giving them is not the same. Varro through the whole passage seems to have more clearly in mind than Vergil the thought that some things grow better in certain places than others. So his examples, to prove this statement are of some extraordinary feature of the products of different lands. The fact that in Creta the plane tree does not lose its leaves, at Elephantine, neither the figs nor the vines lose their leaves even in winter, proves that these places are especially adapted for raising these things. For the same reason the fact that some places are more adapted for producing certain things than others - many things are twice bearing - vines at Gmunda, the apple in the Ceresinian field. For the same reason some things cannot live except in damp places or in water, and even then in a particular kind of water. In Transalpine Gaul there are places where the ground is covered with white chalk and nothing will grow. Vergil's examples simply show that different countries have different products. Involucris sends forth its saffron fragrance, the naked Chalybes, iron, Pontus cattle, Epeirus horses. So the thought in the two passages is not exactly the same, as has been said the connection in which the discussions occur in the two works is not the same, neither is there any trace of similarity between the two in the form of expression so that in the treatment of this topic Vergil was not influenced at all by Varro.

In Georg. II 109-135 the poet expresses the same thought except that he has just been

speaking of the propagation of trees and so all of his examples are of trees; and where the different kinds grow best. There is nothing in Varro to correspond with this passage.

Both writers treat of the nature of the different soils but there does not seem to be much similarity in their treatment. Varro's discussion

Chap IX is much fuller and more systematic than Vergil's. In giving the different kinds of soil he names, stony, gravelly, chalky, clayey, &c. The next division he makes is moist, dry and intermediate. Wheat is best suited for moist land, barley for dry.

Randy land is divided according to color into whitish and reddish. The white is not good for ships, the red is. Soils are again divided into rich, shallow and intermediate. In the shallow soil the meadows are parched and mossy, the trees stunted, the vines unfruitful. In a rich land you can see grain, crops every year and everything without moss. The intermediate if it inclines toward the rich soil is better for all things, than if it inclined to the poorer.

Vergil's treatment is rather brief - only five kinds of soils in all being mentioned. First, stony lands and rugged hills where mud and gravel nourish brambles, are suitable for olives. Second, a rich and moist slope exposed to the south is suitable for vines. Varro also implies that vines should have a rich soil when he says that they are unfruitful in a shallow land.

Third, sand like that of Tarentum or Mantua

is good for grazing. Fourth, black, rich crumbling soil or land from which timber has been cut is good for grain. Varro also recommends rich soil for grain. Fifth, a thin gravelly soil may supply casia and dew for bees. Lufa and Chalk surpass all lands in supplying food for snakes.

The two instances already mentioned where both authors give rich land as suitable for both grain and vines, are the only cases where the two passages correspond at all and in these places, Virgil does not seem to have followed Varro for besides advising that the land should be rich for grain he says it should be dark and crumbling or land from which timber has been cut. For vines besides rich soil he also says that they should be planted on a moist slope which faces the south.

So we see that Virgil in his discussion of the nature of the soil also, made no use of Varro's treatment of the same subject.

To distinguish soils Georg. II 225-258 Varro. Varro simply gives the statement that you can tell whether fields are suitable for cultivating or not from the soil itself by observing whether the land is white, black, light, whether it breaks easily when dug up, whether it is ashy or very dense.

Then too you can tell its nature from the things it produces by observing whether wild things are abundant, and whether it is productive of those things which ought to grow from it.

Virgil tells just how you can tell each kind, giving every quality of soil mentioned by Varro

and adding besides these, a cold and briny soil. He also again in this connection says something about the aptitude of each kind of land. You can tell by the eye which soil is black and the color of each. Whether a soil is heavy or light, can be told by the weight. To correspond to Varro's third point - You can tell whether a soil is suitable for cultivation by observing whether it breaks easily when dug up - Vergil says: If the soil sticks to your fingers, and does not crumble when handled it is rich. You may know whether the land is loose or very stiff by digging a pit, and then stamping the earth into it again. If there is not enough to fill the hole the soil is loose, if more than enough, dense.

If the land produces large weeds, and if the crops are too luxuriant the soil is very moist.

These are not taken up in the same order in which Varro gives them and I should not say there was sufficient resemblance here to indicate that any use had been made of Varro.

Propagation Georg. II. 8-82. Varro 39-45.

Vergil divides the methods of propagation into two classes: natural and artificial. The natural methods are divided into three classes.

First, those that spring up without the help of man of their own accord (*sua sponte*), and spread widely over the plains and winding rivers, like the osier, poplar and willow groves. Second, those that spring up from seed dropped like the chestnuts and oaks. Third, those that come from suckers.

Vano does not distinguish natural and artificial methods but divides the methods of propagation into four main divisions. The first, seed; second, the transferring of live roots from the earth into the earth; third those that are taken from the trees and are planted in the ground. fourth, grafting.

The first main division, seed, is divided into two divisions: the seed that is hidden from our senses, and that which is clear to our senses. or as Vano expresses it in another place, those that spring up before they are sown without the aid of the farmers and those that are collected and sown before they spring up. The first kind, those that are hidden from our senses I think corresponds exactly to Vergil's first division. In this class Vano says is included those seeds, if there be such, which are in the air as Anaxagoras says and those that the water is accustomed to carry into the fields as Theophrastus writes. This, as I have said is what Vergil probably means by his first class when he says: "Those that spring up without the help of man of their own accord, and spread widely over the plains and winding rivers. The expression *"sua sponte"* does not mean without seed at all but without visible seed.

Vergil's second class, those that spring up from seed dropped, evidently does not refer to the sowing of seed but simply to the dropping of the seed from the trees. Vano does not give this as a separate division. He probably thought of them as included in his first class.

Vergil says nothing about the sowing of seed

by hand. In this connection Vano cautions the farmer to choose his seed carefully, care being taken that they are not old, that they are not mixed, and that they are genuine. Age sometimes changes the nature of a seed. For from an old cabbage seed, turnips sometimes spring up and likewise from old turnip seeds, cabbage!

Virgil gives six methods of artificial propagation two of which, the planting of trenchons cleft in four parts and stakes sharpened at the end, and the planting of pieces of the trunk are not given by Vano. The other four Vano also gives: transplantation of suckers, layers, cuttings and grafting. After simply naming the different methods Virgil returns and discusses each briefly. The trees that grow up of their own accord are unfruitful so are those coming from suckers. Those that spring up from chance dropped seeds, grow slowly, but each may be improved by cultivation.

In taking up the artificial methods again, he names the method which may most profitably be used with the different kinds of fruits. Olives grow best from trenchons, vines from layers, hedges from suckers. Others, as the albutus, chestnut and pear, grow best from grafting. The poet describes inoculation which he says is not the same as grafting. When the buds sprout forth from the middle of the bark and burst the thin coats, there they introduce a bud from a strange tree. Vano does not give any of these particulars which Virgil does. In naming the different methods of propagation he tells which

each should be done. In dry rocky places suckers should be transplanted in the spring time. In rich lands in the autumn. Layers should be cut from the old tree or vine before they begin to bud or blossom. Cuttings should be made from the tender branch equally on all sides and about a foot long. In grafting you should be careful on what trees you graft. For example the oak does not receive the pear although it does the apple. Neither should you graft too many things on one tree. Then he gives a new method of grafting which he says has just been discovered in the case of trees that are near each other. The branch is cut and split, and then drawn over to the branch of the other tree. Where they touch, it is smoothed down on all sides with a knife so that from the side that looks toward the sky it is curled down back with back. The next year when the branch shall have grown into the tree into which it is propagated it is cut from the tree from which the propagation was made. Water is not good for fresh grafting for it makes the tender shoots rot. So the best time is in the autumn at the sign of the dog.

A little vessel of some kind should be fastened over those slips that are less tender in nature that the water may drip slowly down and nourish it that it may not dry out. The back of the slip must be pierced whole and so sharpened as not to expose the marrow. That showers may not harm them from without nor too much heat, it should be covered with clay and bound with bark. The vine should be cut three days before it is grafted so that if there is too much moisture in it it may flow out before it is grafted. Or a place may

be cut in the tree in which they graft, a little below the place where they engraft where the moisture can flow out. On the other hand the fig and Punice apple which are dry by nature, are grafted immediately.

In some cases, as in figs the slip should have a bud on it. Thus we see that Varro gives a great many details which Virgil does not use, and Virgil gives several not found in Varro. Mishuk are the main divisions of the subject as a whole the same.

Virgil's discussion bears great similarity to Theophrastus treatment of propagation.

Theoph. pl. II. 1. "The generation of trees and plants in general is either spontaneous or by seed or by root or by suckers or by sets or by cuttings of the young shoots, or by layers or above by cutting the wood into small pieces for that way also a plant will rise. Among these the spontaneous generation seems to be the principal; and those that are by seed and root appear the most natural; for they are in a manner spontaneous and therefore suit with wild plants whereas the rest are procured by the art and industry of man."

Without doubt Theophrastus was at least one of the sources of Virgil's information on this point and from the lack of any specific traces of similarity between Varro and Virgil we may safely say that the poet was not influenced by Varro in this case.

Method of planting vines. Georg II 272-287 Varro.

Virgil advises the farmer thus in regard to the planting of vines: "If you plant on hills, plant them in rows and just as when you plant on the

plains let all the paths agree with each other when the trees are planted just as when a long legions has arranged its cohorts for battle and the lines stand drawn up on the open plain. - - - - - Let all be laid out in equal and regular avens not only that the view may please the idle mind but because in no other way will the earth give equal strength to all and enable the branches to spread into the air."

I believe that Virgil means to recommend here the quincunx order as the best for planting vines. This was the customary order, as is shown by Varro, Cicerro, and Columella all of whom say distinctly that the trees should be planted in the form of the quincunx. One of the objections to this interpretation of Virgil is that this way of drawing up the army had vanished before Virgil's time. This does not have much weight however, for Virgil could very easily adopt a comparison made while the old arrangement of the army still existed. Conington, also opposes this view on the ground that "quadret" 278 l., and the 284 l. - "omnia sint paribus numinis, dimensa iuvanti" let all be laid out in equal and regular avens - both point to the form of a square. For the avens could not be equal if the trees were arranged in the form of a quincunx, and if the square is adopted "quadret" too has its primary meaning.

In reply to this it may be said that "quadret" very frequently has the meaning "fit, agree or tally" and the 278th l. would then read Plant in rows so that after the vines are planted each path may agree with the one leading obliquely across it. And the

284ℓ - the rows should be equally and regularly laid out means that the spaces between the single rows of vines should be equal and should be at equal intervals from each other, perpendicularly, horizontally and obliquely. So I think, considering that the custom seems to have been to plant vines and trees in the form of a quincunx and that there is nothing in the text that opposes this interpretation, that this is what Vergil intends to say in these lines, and he may have borrowed his thought from Varro, although the connection is not the same. Varro is treating of the condition of soils and divides the topic into two divisions one which nature gives, and one which sowings impart. In treating of the second division he says: Follow those things which make the field more beautiful in appearance so that it may be also more fruitful as trees are, if they are planted in the form of the quincunx, in rows and at moderate intervals. Our ancestors from a field equally large but poorly sown received less wine and grain and of inferior quality. For those things that are placed, each in its own place, these occupy less space and do not keep the sun, moon and wind from each other.

It is possible to see this also in other things as nuts which you can put when they are whole into one peck measure because the shells are each in its own place in which nature placed it, when the same nuts are broken you can hardly put them into a peck and a half measure. Besides when the trees are planted in rows the sun and moon ripen them equally on all sides so that grapes and olives are pro-

duced in greater abundance and are ripened more quickly. As a result they produce more wine and oil and of greater value. Although the connection in which the passages occur is not the same - Varro brings it in in connection with his treatment of the soil and Vergil is discussing vines - neither are the details the same, still Vergil may have taken his idea, which he expresses very poetically, as to the form in which trees should be planted from the *De Re Rustica*.

Cite of Goats Georg II 371-396. Varro, chap II.

The vineyard, Vergil says must be surrounded by a hedge especially when the vines are young, to keep out buffaloes, cows, sheep and hinds and especially the goat, for its bite is poisonous and does more harm than heat or frost. For this reason the goat is slain to Bacchus. The same thought is expressed in Varro's second chapter.

Agrius says: You deprive the herds of their sustenance by the laws of Agriculture in which it is said that a farmer should not feed them in a field planted with young trees. Fundanius answers. The laws only say some herds, for some herds are injurious and poisonous to Agriculture as the goats. For they injure all young crops by their grazing, especially vines and olives and so it has become the custom to sacrifice victims from the race of goats for they injure all young crops by their grazing, especially vines and olives and so it has become the custom to sacrifice victims from the race of goats to some of the gods and not to others, since by reason of the same hatred some are unwilling to see them

Wishing others wish to. So goats are sacrificed to Bacchus the father of wine so that they pay the penalty with their lives. On the other hand nothing from the race of goats is sacrificed to Minerva on account of the olive because they say that when she is injured, the olive becomes barren. They have never been driven into the citadel of Athens except for a necessary sacrifice that it might not be possible that the olive tree which is said to have been produced there first be touched by the goat.

Here the resemblance is as close as you could expect two writers of such different style and temperament to resemble each other except that at first glance one might say if the poet obtained this from Varro why does he not go on as his model does and have the farmer that the goat is not to be sacrificed to Minerva especially as Vergil is treating of the olive as well as the vine as he himself states at the beginning of the book. In the first place he is discussing vines alone at this point and could not be expected to bring in the olive. Then when he finally does come to treat of olives he dismisses them with a few words - simply saying that they need little cultivation and will grow of their own accord after they are fairly started. I have been unable to find any other writer before Vergil who gives this caution in regard to goats, and it seems to me this passage was probably taken from Varro. These two points are the only ones in Vergil's treatment of vines where he seems to follow his predecessor. Varro does not give

a connected systematic treatise but a number of precepts may be found scattered through his first book.

Chap. VII. There are many kinds of vines. Some grow low without props, others high. Then the methods and things used for supporting the vines are given.

Chap. XXV. The small Arminian and Helvian should be planted in a place exposed to the sun. Uthar, as the large Arminian, the Murgantier and Lucanian in a heavy shaded place. In all kinds of vines the props should be turned to the north to protect the vines. If you plant cypresses for props plant in alternate rows, do not let them grow higher than other props and do not plant vines near them.

Chap. LVIII. Grapes keep best in jars. Wine will not ferment in less time than a year.

Then it is interesting to note that when Varro divides the year into eight intervals and tells what should be done in each, the mercurial work that should be done on the vines in every interval except the second and fifth.

In the first they are to be trenched, in the third trenched in the fourth the old vines are to be dug about for the second time, the new vines for the third. In the sixth interval the grapes have to be gathered and wine made.

In the seventh interval, prune the vines, and in the eighth also prune them. Thus he mercurial labor that must be expended on the vines during the whole year. Virgil too speaks of the incessant digging and trimming which the vines require. Lines 347-407.

"Again too there is the other heavy toil of dressing the vines, a drain that is never satisfied. For the whole soil has to be broken up every year three and again and the clods to be crushed incessantly with the horse-back. The whole plantation has to be lightened of its foliage. Back upon the husbandman comes his labour in a round as the year retraces its own footsteps and rolls round upon itself. And now already when the vineyard has shed its lingering leaves and the cold north wind has stripped the woods of their beauty, were thus early a keen farmer stretches his forethought to meet the coming year and with Saturn's hooked fang in hand preserves the former vine clippings as it grows and prunes it to the shape he will." Conington's translation.

Summary of the results obtained from the comparison of specific passages.

Virgil disagrees with Varro in only one point. In treating of the seasons for sowing different things he says, sow beans (faba) in the spring whereas Varro gives the fall as the most suitable time.

In the following passages Virgil has expressed the same thoughts as Varro: His treatment of plowing Georg. I 43-49. Fallowing and Rotation II 83. The method of planting vines Georg. II 272-287, his discussion of the poisonous effect of the bite of goats II 371-376, the precepts for irrigation.

Then there are some passages where the treatment is partly the same but not entirely.

Among these are: the times for sowing I 204-230, the tools which the farmer needs, I 160-175, the threshing floor I 175-186, methods for distinguishing soils Georg II 225-258, propagation II 8-82.

In two passages: the lucky and unlucky days of the lunar months I 276-286 and the adaptability of the soils the same subjects are treated but not at all in the same manner.

In deciding whether Vergil borrowed all or any of these passages where the authors agree in whole or in part, from Varro, the subject presents great difficulty, from the fact that we do not possess all the works written on Agriculture before Vergil's time from which the poet might have obtained help, and from the impossibility of becoming acquainted with all of the many sources at hand which we know Vergil used.

In consequence of this difficulty results cannot be absolutely decisive but as far as I can discover, the following points were borrowed from Varro: plowing Georg I 43-99. Fallowing and Rotation 70-83, the method of planting vines Georg II 272-287, the poisonous effect of the bite of goats II 371-396. The general statement as to the time for fall sowing I 204-230. Sowing 175-186 Georg I the discussion of the threshing floor seem to have come in part at least from Varro.

The precepts for irrigation I 100-117 and propagation II 8-82 might be assumed to have been taken partly from the *De Re Rustica* if it were not for the fact that they bear so much closer

resemblance to other writers - Homer and Theophrastus.

In lines 160-175 Georg. I. the tools which the farmer needs and lines 225-238 Georg. II. Methods for distinguishing soils the resemblance seems to be too slight to warrant the conclusion that the *De Re Rustica* was used at all.

The topics treated in Virgil's 1st and 2nd Georgics of which no trace is found in Varro.

In the 1st Georgic the topics which Virgil treats of which there is no suggestion in the *De Re Rustica* are chiefly in the nature of digressions and episodes ^{which} you would not expect to find in the more matter of fact and prosy work of Varro.

There are few didactic points given which Varro too does not touch upon. The first is in l. 112 when the poet advises the farmer to feed down the too luxuriant crops.

l. 187 When the walnut trees bear well the corn crop will be good.

l. 192. Steep acid brans in water and oil to make them yield more abundantly and cook more quickly.

287-310. Many things can be done best at night or early in the morning as the cutting dry grass. In the winter nights the trochus may be pointed. In the middle of the summer the corn has to be reaped and threshed.

Winter is the time for idleness but even then across berries and shoes may be gathered.

l. 330-463 are taken up with the signs of the weather which Virgil borrowed from Aratus.

All the other passages in this first Georgic are chiefly episodes and digressions. These take up nearly half of the whole book.

ls. 118-160 show Virgil's deep feeling for the dignity of labor. 310-330 contain very little that is didactic - merely the simple statement that one should guard against the storms of autumn and the rainy seasons of spring. Then the poet takes up all the rest of the passage with a vivid description of a storm. One of the many touches by which he makes the poem attractive to those who are not especially interested in Agriculture.

ls. 463-480 are taken up with the signs of Caesar's death. 487-570. The book closes with a patriotic tribute to Augustus.

So we see there are but four purely didactic passages found in the first Georgic not mentioned in Varr.

In the second Georgic there are very few things that come from Varro. In fact there is very little in the *De Re Rustica* that could have been of use to the poet in the composition of his work. The book is given up entirely to trees and vines. While Varro takes as the subject of his first book the broad theme Agriculture and the treatment of vines comes in incidentally and scattered here and there.

In ls. 82-108 he names some of the different kinds of trees and vines which are so numerous that it would be as impossible to count them as it would to count the Libyan sands or the waves of the Ionian Sea.

259-420 Vines. As has been said only two of the precepts given by the poet on vines are found in Varr.

Expose the soil and dig trenches in the Mts before you plant vines. A crumbling soil is best. Be careful to transplant them in the same position as when in the nurseries. If you plant on the plains plant densely. If on the Hills in rows rather far apart so that the paths may exactly correspond in the form of a quincunx. The trenches may be shallow but the supports ought to be planted deep and especially the oak. Do not let the vineyard face the setting sun. Do not plant hazels among the vines. Do not take slips from the top branches. Do not cut them with a blunt knife. Do not plant wild olives as supports for the vines. Do not plant the vines when the north wind is blowing. The best time is in spring or autumn. After the vines are planted loosen the earth often. Props must be made of light rods or shafts of peeled shrub-wood. When the vines are very young spare them. After they are a little older when the leaves are too thick pluck them with the hand. Later the branches and leaves may be cut with a knife. The earth must be constantly loosened and broken.

420-8. Olives do not need much cultivation.

429-457. Fruit trees too when they are well started grow without the help of man. These wild trees have many uses. What equally worthy of memory has the gifts of Bacchus given. Bacchus has furnished causes for crimes. He maddened the Centaurs who with their great bows threatened the Lapithae.

Here again about a third of the book is taken up with interesting subjects wholly unconnected with agriculture.

In lines 735-76 with glowing enthusiasm and

gral he praises Italy as the land of great harvests. We find Varro too praising Italy for its crops more abundant than those of any other land. There seems however to be no resemblance between the two eulogies and Vergil does not seem to have made use of Varro at all.

Lines 315-345 - his description of spring show his sympathy and love for nature.

The beautiful eulogy on rustic life 458-542 closes the second book.

Comparative value of Vergil and Varro as practical farmers.

Varro composed his work from a rich fund of knowledge obtained from the study observation and experience of eighty years. Besides immense flocks of sheep in Apulia and many horses in the country about Brati (the *Re Rustica* 1611) Varro had three large farms: at his villa at Cumae, at Tusculum and near the town Casinum, and on this farm there was an extensive aviary described in the third book of the *Re Rustica*. On these farms he spent a large part of his time. As Truffel says of him, Learning and long practical experience furnished the author with rich materials and our folk how firmly and with what pleasure he handles these subjects with which he was so familiar.

"He belongs", says Crutwell, "to the genuine type of the old Roman, improved but not altered by Greek learning, with his heart fixed in the past, deeply conversant of every thing natural

and even in his style of speech protesting against the innovations of that day. If we reflect that when Varro wrote his treatise on husbandry, Virgil was at work on his Georgics it seems almost incredible that they should have been contemporaries.

Nearly all his books are parcelled out on a very methodical plan. He had no idea of following the natural divisions of a subject but always divided his subject into artificial categories of his own. The nature and style of the *De Re Rustica* is by no means an exception to this general tendency on the part of the author.

Varro is very practical in his treatment of his subject. He discusses the whole subject of Agriculture, first dividing it into four main parts. I. The soil, its nature and characteristics. II. The tools a farmer needs, including slaves, oxen, dogs, plows etc. III. When the different things should be planted and how the land should be prepared beforehand. IV. At what time of the year different things should be done. In several of these points he goes into details and discusses them at great length, especially in his treatment of the soil and the times of the year suitable for different kinds of work. The last of the book is again divided into six divisions with reference chiefly to the different crops which the farmer raises. First, the preparation for the crop is discussed; Second, the sowing; Third, nourishment; Fourth, gathering of the fruit; Fifth, storing it away; sixth, bringing it out. Thus he treats very fully and completely of the cultivation of the fields in all

its pleasures. Everything is disposed of under these heads and seldom else does the author depart from his subject, or from these arbitrary divisions which he has imposed upon his theme.

The Georgics, on the other hand are not at all practical as a general guide book for farmers. It was not Virgil's purpose to give a full treatise on husbandry. If he had been giving a complete discussion of the subject there are many practical points found in Varro which the poet would probably have made use of. Among these, the methods of reaping grain, the best way of storing away grain, hay, olive, beans & all the different products of the farms, the different kinds of hedges and how they are made, the different kinds of props for vines. If the first and second books of the Georgics are examined closely however it will be seen that the didactic portions of these books are comparatively limited. It was not Virgil's purpose and object in undertaking his task to compose a work equally pleasing to the reader concerned with farming and at the same time instructive to the farmer. He seems to have chosen the themes most interesting to him and those which would afford the greatest opportunity for an interesting and practical treatment. Now does he give such precise statements as the number of hired hands, oxen, wagons etc, the farmer should have or how many pecks of different things should be planted to the acre, or how many days it takes things to come up.

Not much use is made of Varro

in either the first or second books of the *Sergies*. However perhaps as much as could be expected considering the character of the two works and the disposition of the author. Nearly one half of the first book is taken up with subjects entirely apart from agriculture. Then the subject of the didactic portion of the book is limited.

Altho the part starts out with the broad theme Agriculture, he treats chiefly of the tillage of the ground with a view to crops, especially corn. Two of the most important points; plowing and rotation and a part of the treatment of sowing and the threshing floor seem to have come from the *De Re Rustica*.

In the second book not much opportunity is offered for use of Varro as his treatment of vines is very incomplete and unsystematic. Only two minor points are taken from the *De Re Rustica*: the method of planting vines ^{- in the *Quincuplex* order} and the poisonous effect of the bite of goats.

Author of the 1st Book of Varro's *De Rustica*.

Chap. I.

Introduction. Had I worked more leisurely Fundania, I should have more fittingly written these things for you which now I shall set forth as well as I can thinking I must hasten, because as they say, if man is a mere bubble, so much the more is it true in the case of an old man for my eightieth year warns me that I should collect my baggage before I depart from life. So since you have bought a farm which you wish to make fruitful by cultivating it well and you ask that I take care of it I will try I and not only will I try to advise you while I live as to what should be done but even after my death. May I not permit the Sibyl not only while she lived to have sung those things which helped men but even after she died and that too even the most ignorant of men. To whose book we are accustomed to refer so many years when we want to know from some portent what must be done. I say I will not permit her to be so useful while I not even while I live do that which may help my friends. And since as they say the gods help men I will invoke first the twelve gods who are leaders of agriculture. (The twelve gods are named) Now that these gods have been invoked I will relate the conversations which we have recently had about Agriculture, from which you will be able to know what you ought to do. I will refer you to Grecian and Roman writers whom you may consult in case there may be some things you want to know that are not in these conversations. (Then he names a long list of Roman & Greek writers) I will attempt to set forth these things in three books cutting out everything that does not pertain to the cultivation of the field. My knowledge has been gained from three

sources, experience, from things which I have read and from what I have heard.

Chap. II.

At the seed time festival I came into the temple of Telles having been invited by the overseer. There I met a number of friends who had also been invited and as the overseer had not yet come we sat down to wait for him. Some one asks Agrius, one of the company, "What place have you, who have travelled over many lands seen more cultivated than Italy?" Agrius answers, "I think that no place is so entirely cultivated. There are some regions between the northern circle and the north pole where the sun is not seen for six continuous months and where nothing will grow. But in Italy what is there that is not grown not only fit for use but some excellently?"

What shall I say of the Spelt of Campania, the wheat of Apulia of the vines of Tarentum or of the olives of Brundisium? Is not Italy planted with trees so that all of it seems like an orchard? Is Phuggia which I once calls rich in vines more covered with vines than it? Or Brundisium which the same poet calls rich in corn? Then the question comes up, "What are the objects of Agriculture usefulness or pleasure?" Seneca says, "First we must decide what is included in Ag. whether what is sown in the fields or what is brought into them also as sheep and goats. (Fundanius) Certainly pasturing is one thing and Ag. another yet they are related just as the right flute is one thing & the left another, yet they are joined in a way. One plays the treble the other the accompaniment. The life of the shepherd is the treble notes, that of the farmer the accompaniment." In this connection the passage about the life of the goat comes in. It is finally decided that pasturing is not a part of Agriculture.

rather are potters shops or silver mines and other mortals which are the products of some fields. Some writers even give remedies for pains in the feet by repeating these words nineteen times: *Terra prestem tibi, salus hic manito in meis pedibus*. Even Cato gives receipts for panaches and salting down hams. All these things should be excluded.

Chap 94. We now come back to the original question - whether the chief object in farming should be usefulness or pleasure. Both are very important and the farmer should strive for two goals, usefulness and pleasure. The care which makes a field more beautiful also makes it more fruitful & valuable. The more useful is also the healthier. This does not diminish the value of science, for often an unhealthy place may be made healthy. This much Varro gives by way of introduction. Then he divides his first book - the cultivation of the fields - into four main divisions and each of these has two subdivisions.

- Chap V I. The knowledge of the field, its soil and constituents
- (1) The things which pertain to the soil of the earth.
 - (2) Those that pertain to villas and stables.
- II. What should be possessed for the culture of the field.
- (1) Animate things.
 - (2) Inanimate things.
- III What should be done for cultivating the field.
- (1) What must be prepared beforehand.
 - (2) Where each thing should be planted.
- IV At what time each thing should be done in the field.
- (1) The things that must be referred to the annual course of ^{of sun} sun.
 - (2) What must be referred to the monthly course of moon.

Chap IV

I. 1. Four things must be considered in regard to the soil
 a. What is its appearance (forma). (b) What are the characteristics of the soil. (c) How large the field should be. (d) How it may be safe.

Chap IV.

a. There are two kinds of "forma". One given by nature as flat, rocky and hilly land. That field is best which lies at the foot of a Mt. & looks toward the south. Corn does best on the plain, vines on hills, trees on Mts.

The other "forma" is given by cultivation. This rule may be followed in cultivating fields. Follow those things which make the land more beautiful in appearance and at the same time more fruitful. As the planting of trees in the form of the quincunx.

b. What are the characteristics of a field that it is called especially good or bad? Examples are given showing that some things do grow better in certain places. Here some are interrupted by remarking that Cato says some fields are better than others in vine growing placing land that produces an abundance of good wine first. Cato disagrees and puts meadow land first.

Chap IV.

Tho he says it makes a difference what kind of wine it is. For there are many kinds. Some are low without props as in Spain and others are high called "jugatae" as in Italy. Then the methods for supporting vines and the different kinds of props used are given. (b) Returning after this digression to the

Chap IX

characteristics of the soil he names the different kinds as chalky, sandy, moist etc. and in some cases gives what grows best in each kind. Then he mentions methods of telling whether the soil is suitable for cultivation or not.

- Chap. X & XI c. How large the field should be. Varro gives different methods of measuring land. Not many he says have failed in measuring out fields.
- Chap. XII & XIII These treat of the villa and its position.
- Chap. XIV I. Under this subdivision - how it may be safe through itself Varro describes the different kinds of hedges.
- Chap. XV & XVI Under this division also he brings in things that are outside of the field, yet are connected with it, cautioning the farmer to take care that his fields do not have as neighbors those who steal & rob, that there are places near where the products may be sold and things may be bought, that there are good wagon roads & navigable rivers near.
- Chap. XVII & XVIII II. The second main division - things needed on the farm - is divided into vocal, as slaves and hired men; semivocal, as oxen and dogs; mute, as wagons and ploughs. Under each of these heads the author discusses how many are needed for different sized fields.
- Chap. XIX & XXIII III. What must be prepared beforehand and where each must be planted for the cultivation of the fields. It is important to consider what should be sown in each place, for some places are suited for hay, others for grain, some for wine, others for oil. There is not need much moisture. Clover, beans and chickpea grow best in thin land. In rich land, wheat, flax and cabbage. Some things, as beans are not sown for their immediate use but looking forward to the future are planted to enrich the land. Willows and reeds require moist places. Asparagus a shady place. Plant your violets and gardens in sunny places. Some kinds of olives require rich, heavy land, others thin land. So also some vines should be planted in a place exposed to the sun, others in a heavy

shaded soil. In all kinds of vines, the props should be turned to the north to protect the vines. If you plant cypresses for props, plant in alternate rows and do not let them grow higher than other props nor plant vines near them.

Chap XXVII

IV. The fourth main division - time for sowing is divided first, according to the annual course of the sun into: spring, when the land is plowed and the sowings are made; summer, when the harvests are gathered; autumn, when the grapes are gathered and woods cultivated; winter, when the trees are pruned.

Chap XXVIII

Then a smaller division is made according to the monthly course of the moon into eight parts, each a month and a half long. Varro tells the things that should be done in each of these intervals. These are all the common tasks of farm life, such as in the first interval, between early spring and March 21, the sowing is done, vines trenched, crops weeded and the ground plowed. In the second interval, between March 21 and May 21, weed the crops, plow again, cut willow, sow the olives and prune them.

After taking up each of these intervals in this way separately, he treats of the lunar days.

Chap XXIX

Then one of the company, Stolo, suggests another division connected to some extent with the sun and moon. 1st Preparation for sowing must be made; 2nd, the sowing must be done; 3rd the things sown must be weeded; 4th gathered; fifth, stored away; sixth, brought forth.

Chap XXX

I. Under the first head, preparation, the author says, "For some things the ground should be dug up as for orchards, for some plowed, as for crops, for some the earth must be turned up with the mattock. Any land must be

irrigated and all lands should be manured. Here he gives a discussion of the best kinds of manure.

Chap 39-41

II Under sowings he discusses propagation, cautions his reader not to plant his seed in too dry or too wet earth but moderate. In one acre if the land is moderate you should plant 12 pks of clover. Clover should be sown in land that is well worked.

Chap 43

Chap 44.

Beans are sown four pks to the acre, wheat five, barley six, spelt ten. In some places more is planted, some less according to the density of the land.

III In treating of the nourishment of the things that have been sown, the ^{fruits} ~~things~~ that are born in the field are nourished there and bring forth fruit and if you pluck a flower or pear nothing will grow in the same place that year.

Chap 45.

Then he tells the number of days it takes various things to come up. When you remove plants from a nursery into a colder place the tender ones should be covered up with leaves. The olive and fig should be especially protected. If rains follow you should see that water does not stand on them.

Chap 46.

Here comes a slight digression, one of the few in the *Re Rustica*. The roots under the earth do not grow at the same time nor with the same rapidity as the branches above.

The roots grow first and more in the autumn and winter because they are kept warmer than the branches. They do not extend farther than the warmth of the sun reaches. There are many different kinds of trees and from some the time of year can be told by the way the leaves turn. For which the olive, white poplar and willow change their leaves it is said to be the solstice. The heliotropes too are named because they look in the

morning to the rising sun and so follow it to its setting that they always look toward the sun.

Chap 48. Next he gives the names of the different parts of grain. Here again Varro's fondness for tracing etymologies is seen. Many of these attempts are truly absurd. For example, *diosta* is so called "quod aestet primum"; *spica*, "a spi" from the hope it holds out of a future harvest.

Chap 49. IV When the grass ceases to grow it ought to be cut with scythes and turned over with forks until it is thoroughly dried. Then when it is dry, bundles should be made and it should be carried to the villa. Then the stubble should be scraped up and the hay collected. Then the *muradnos* should be mowed.

Chap 50. Three different ways for reaping grain are given.

Chap 51. The description of the threshing floor already discussed comes next.

Chap 52 & 53. The different ways of separating the grain from the heads in the threshing floor are given.

Chap 54 & 55. Be careful in gathering the grapes to take the ripest first. Olives should be gathered rather than shaken off to keep from bruising them. They should be plucked with bare fingers rather than with gloves on. What cannot be plucked should be knocked off with a pole. After when they are shaken off they take things with them and this is the reason why they do not bear in alternate years or at least not so abundantly.

Chap 56-61. V Hay should be put under cover rather than in stacks. Wheat in high granaries, plastered and well protected. Some have granaries underground. Beans will keep well in olive vases sealed with ashes. Grapes keep well

in jars. Apples are kept in a dry cold place. Olives are preserved by rubbing them with salt and exposing them to the sun. Also in must boiled down.

Chap 62-83. VI Fruit is brought out either to look at, to use or to sell. It should be brought out and examined because worms sometimes begin to eat it. Vessels of water should be placed near the fruit in the sun and where they come to it they will kill themselves. If you want to use wheat for food, it should be brought out in the winter and bruised and roasted.

Chap 64. The watery portion is drawn off from olives and then boiled down in bronze vessels over a slow fire. Wine is not ready for use in less than a year.

Chap 66. White olives are bitter if used too quickly so are black ones, unless you sprinkle them with salt.

Chap 68. Things that have been hung up as grapes, apples and service berries show by their color when they are ready for use.

Chap 69. Bring things out to sell when they will bring the highest price.

Then the servant of the overseer came and said that his master had been killed in the street. So Naro and his friends leave the temple.

The Her which Virgil makes of the first
Book of Varro's *De Re Rustica*.

Mary Watson Sillards. May 20th 1901

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